



Stormwater

CONNECTIONS

Spring 2005

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Be smart about lawn care!

Spring has arrived and the grass is growing in leaps and bounds. All of a sudden our new focus in life is mow, water, and weed — over and over and over. We all know that leaving a lawn unattended now means more work later.

But did you know the average lawn consumes about 10,000 gallons of water over and above the normal rainfall, or that keeping your lawn trim typically requires 40 hours of mowing time per season? Of course, that doesn't include weeding, fertilizing, and more.

Understanding the key elements needed to maintain a healthy lawn lets you work with nature to create an attractive, low maintenance lawn that's also good for the environment.

Short cuts?

Before cranking up the lawn mower, be aware that setting mower blades too low or using dull blades can cause more damage than good. If you remove more than 1/3 of the grass blade at a time, you diminish nutrient reserves in your grass, causing stress conditions and a decline in health. Maximize your time by using a mulching mower, or adjust your mower to operate without a grass catcher. The grass that is left behind will help retain moisture in your lawn. And, there's no bag to haul off.

Vicious cyle

Adding fertilizer to your lawn can help enhance nitrogen levels in the soil. But what should you use? Lush blue-green lawns look nice but come at a cost to both homeowner and the environment. Many chemical-based fertilizers are quick release. As a result, grass tends to green quickly with rapid leaf growth at the expense of healthy stem and root growth. That makes grass more prone to disease, thatch buildup and drought damage. These lawns quickly become hungry again, needing more fertilizer to maintain their color. For a long-lasting effect, use a slow-release organic fertilizer. In most cases, fertilizing once a year is plenty. To help build the lawn's nutrient-reserves, fertilize in the fall.

Conquering Weeds

Are weeds appearing in your yard? They may be an indicator that something is out of balance in your soil. For example, dandelions thrive in soil with low calcium. Correct the nutritional deficiencies to reduce and eliminate weeds.

Reaching for chemicals? Read the label FIRST and follow application directions for pesticides and synthetic fertilizers. "A sizeable number of households apply more pesticides than needed," according to Paul Lapsley with the Environmental

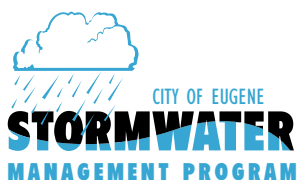


Protection Agency. More than one million households dispose of pesticides in unacceptable ways (sinks, toilets, and in the street). As a result, high concentrations of nitrogen and phosphorus have been found in almost every stream in the United States.

Caring for your lawn in an environmentally sensible way can have a bigger impact than you think. Your lawn is

only a small piece of land, but all the lawns across the country cover approximately 30 million acres — enough to fill an area the size of Mississippi. As you prepare to care for your lawn this season, keep in mind that careful planning on your part can help reduce pollution in our local waterways.

For free handouts on low maintenance lawns, or lawn care tips, call 682-2739.



Stormwater Connections is published by the City of Eugene Public Works Department to enhance awareness of stormwater and related surface water management issues.

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More Stormwater Connections

Stormwater Questions & Answers

Q: There is a drainage channel at the rear of my property that runs through my residential neighborhood. Several of my neighbors routinely dump their lawn clippings and other yard debris on the banks or else down into the channel. This not only looks trashy, but since this channel is maintained by the City, isn't this a violation of some kind?

A: You are right. Dumping lawn clippings, yard debris, and other

landscape construction materials into or onto the banks of a functioning drainage channel is a violation of state or local law, or both. Dumping on publicly owned channels and creeks is considered to be a trespass on another's property and an encroachment on a public drainage easement. As a result, the offending property owner can be required to remove the material. The City has taken enforcement action on several homeowners this year who

have dumped debris, mowed natural vegetation, sprayed herbicide, and even brought in loads of rock into a creek or drainage channel next to their property in order to alter it for their personal benefit.

Piles of yard debris, sod, lawn clippings and other landscape construction materials dumped along creeks and drainage channels do look trashy. But perhaps the more important issue is the problem that occurs when dumped landscape materials eventually fill in a channel, changing its capacity to prevent upstream flooding. Decomposing grass clippings and other vegetation add unwanted nutrients to the water that both stimulate algae growth and rob the water of dissolved oxygen necessary to support fish and other aquatic life that live downstream. Grass clippings and other yard debris can also contain herbicides,

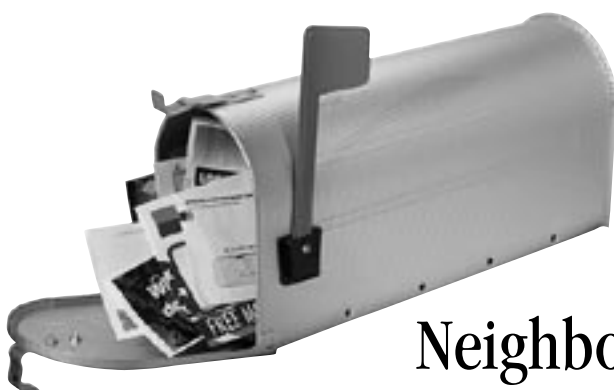
fungicides, pet waste and other yard care chemicals that degrade water quality. Debris that contains seed from exotic and invasive plant species washed downstream can take root and cause additional problems throughout the local ecosystem.

There are plenty of disposal options available. Grass clippings can be used as a mulch around plants, or put into a compost pile or bin. Waste haulers in our area are now required to provide residents with a yard debris container which can be put out on trash pickup days. Larger items like branches or brush can be taken to several local yard debris recyclers such as Lane Forest Products or Rexius. For additional information about mulching, composting, or compost bins, contact Anne Donahue, Compost Specialist at 682-5542.

Q: I saw someone blowing leaves and other debris into the street. I thought the leaf pick up program was over. Can people still do this?

A: Once the City's leaf pickup program is done for the season, leaves and other debris swept or blown in the street are considered to be in violation of City Code. Why? Leaves and other vegetation plug up storm drains and reduce water flow capacity in storm lines that can result in flooding. This debris also pollutes stormwater runoff that eventually empties into local waterways and streams.

Note: City code prohibits the discharge of non-stormwater substances into storm drains, streets, curbs & gutters and open drainage ways that enter the stormwater collection system.



Neighborhoods: A chance to get connected!

If you would like more information about neighborhood associations, contact Steve Norris, Neighborhood Liaison, at 682-5009 or steve.d.norris@ci.eugene.or.us

Do you know what's happening in your neighborhood? Neighborhood Association meetings are one truly local way to learn how City projects and services affect you and how you can influence them. Several associations host social activities, such as potlucks and picnics, providing an easy way to meet others in your area or sponsor neighborhood projects such as clean-ups, park projects, or tree plantings. For example, residents from the Friendly Area Neighbors got together to "adopt a garden" and beautify the recently installed traffic calming circles and bumpouts.



Help! My Roof is Turning Green

The Pacific Northwest is known for its moist, temperate environment where mosses flourish. Unfortunately, moss grows on undesirable areas like roof tops and sidewalks. Although there are commercial moss-control products available, many of them contain ingredients that are very harmful to fish and other aquatic organisms. When products that contain zinc, copper, and other harmful chemicals mix with rainfall and then flow into storm drains, they eventually end up in our local rivers.

Mosses spread in multiple ways and depend on moisture to reproduce. An opportunist, mosses grow on trees, sidewalks, gardens, rooftops, and everywhere in between. Moss has minimal requirements to survive — sufficient moisture

and accessible nutrients. It's no surprise that the moist environment of a rooftop shaded by trees is a desirable combination. Not only does the rooftop stay perpetually moist, but nutrients are also supplemented from any ash that fireplace chimneys produce. Mosses thrive in the winter when there is plenty of water, little light, and low temperatures. When summer arrives, mosses dry out and become dormant until the next moisture cycle comes along.

Tackling moss removal

Start with physical measures first. Moss growth can be limited in the future by decreasing the amount of shade and increasing light exposure on a roof, sidewalk, and deck. Prune overhanging trees to allow more light and air

circulation. Regularly remove organic debris, such as leaves and branches to reduce moisture retention on the surface of a roof, deck, or sidewalk. Manually remove moss with a stiff push broom, wire brush, or flat-edged shovel, or use a high power pressure washer. Keep in mind that too much force or pressure when brushing or washing can damage shingles. To prevent moss from returning, you need to alter the conditions that moss favors.

If physical measures just aren't enough, choose the least toxic chemical controls for moss available. If you plan to replace an old roof, consider using metal (other than copper or galvanized roofing that contains zinc). Moss has a hard time growing where there is nothing to hold on to.



Overhanging branches on a north facing roof provide plenty of shade to support moss growth.

Products should be applied in dry weather to avoid having them run off into streets and storm drains. Always exercise restraint when using toxic chemicals and resist the urge to over-apply a product. If a little is good, it doesn't mean more is better. If more treatment is needed, sparingly apply the least toxic chemical treatment and then, only if it will not mix with water running off the

roof. When it comes to moss control, patience could make a big difference to the health of our fish, other aquatic organisms and our rivers.

Note: City code prohibits the discharge of non-stormwater substances into storm drains, streets, curbs & gutters and open drainage ways that enter the stormwater collection system.

What you should know about product ingredients

Active ingredients listed in a variety of brands we found at several garden stores include: sodium laurel sulfate, potassium salts of fatty acids, zinc sulfate, citric & acidic acids and copper and zinc strips.

Active ingredient	General information	Effectiveness	Negative side effects
Sodium laurel sulfate	Soap based product	Varying degrees of success.	Environmental impacts not stated
Potassium soap of fatty acids	Soap based product that is more soluble in water. Non-staining & won't harm bordering plants.	Varying degrees of success.	Toxic to aquatic invertebrates. Should not come into contact with water sources.
Citric & acidic acids	Lemon & vinegar components. Acidic pH is neutralized quickly when it mixes with rain	Most effective when applied after physically removing moss. Annual applications required.	Acidic components can be corrosive to metal gutters.
Zinc strips	Effectively kill or retard growth up to 15 feet below strip.	Most effective before mosses are well developed and can last up to one year.	Runoff from zinc flashing to surrounding vegetation and water supplies may cause contamination
Zinc sulfate	Zinc sulfate monohydrate usually at concentrations of 99%. Doesn't stain roofs or corrode aluminum or galvanized gutters.	Powder application known to control mosses for 2 years. Spraying may need to be done annually.	Toxic to fish & aquatic invertebrates. Contact with plants will cause harm. Should not come into contact with water sources
Bleach	Chlorine bleach can be applied to decks, patios, walks & roofs in a 1-1 ratio of water & bleach. Keep surface wet at least 30 seconds. Rinse thoroughly with water when done.	Effective up to one year. Annual applications usually necessary.	Toxic to plants if left on more than 10 minutes; toxic to fish & aquatic invertebrates. Avoid contact with water sources.

Delta Ponds Revitalized

Many people are rediscovering Delta Ponds. This much deserved attention is due to a collaborative effort of many citizens, area businesses, organizations, and agencies to revitalize the ponds. Perhaps the most visible change that has occurred at the ponds in recent months has been the manual removal of invasive species, such as Armenian blackberry, Scotch broom and English ivy, on 28 acres of land. By clearing away these invasive plants, there will be space for native vegetation to flourish that will support habitat diversity for a range of wildlife species. By late summer, two more phases will occur to eliminate any remaining invasive plants. Once completed, thousands of native trees and shrubs will be planted throughout the area. Vegetation enhancement work is being funded by the Army Corps of Engineers, the Bureau of Land Management's Cooperative Conservation Initiative, and by stormwater user fees.

Another exciting project taking place at Delta Ponds this year is a new fish and wildlife monitoring program. In early December 2004, a group of University of Oregon Service Learning Program students started working with City of Eugene staff, Oregon Department of Fish and Wildlife (ODFW) staff and volunteers from the Eugene Stream Team to develop and implement a fish and wildlife monitoring

program. A two-way fish trap was installed in Debrick Slough to learn which fish species are moving between the ponds and the Willamette River. From February through July, students will study amphibians, birds and western pond turtles. Amphibian and bird surveys will provide more information about which species are present in the Delta Ponds system. Monitoring of Western Pond Turtles, currently listed on the State's sensitive species list, will help determine the current population of turtles and evaluate their habitat requirements. At the end of the academic year, students will present their findings and provide the City with fish and wildlife monitoring protocols that will allow Stream Team volunteers to conduct follow-up monitoring on these and other species in the coming years. Several Stream Team volunteers are participating in the daily fish trap monitoring. Last year some volunteers trained with ODFW to monitor western pond turtles.

Delta Ponds, a City-owned natural area, extends from the river just west of Valley River Center north and east to the Cal Young neighborhood east of Delta Highway. Stop by and visit anytime. If you have questions about the vegetation or habitat enhancement work, call Lauri Mullen at 682-4925. If volunteer activities appeal to you, contact Lorna Baldwin, Eugene Stream Team at 682-4850.

Photos: (Top) Students monitor salamanders at Delta Ponds. (Middle) University of Oregon students install fish trap in Debrick Slough. (Bottom) workers remove invasive vegetation.



Water – a precious resource

The water cycle works in a remarkable way. The sun's heat evaporates water from the oceans and other bodies of water, releasing it into the atmosphere. The water returns to earth as rain or snow. The rainfall either evaporates again, runs into streams that eventually carry it back to the sea, or, in open areas, seeps into the ground and recharges groundwater aquifers.

Urban stormwater (or rainwater) is surface water that runs off the land into the storm drain system and directly into rivers, creeks, and wetlands. In developed areas the landscape has been covered by streets, parking lots, and buildings (called impervious surfaces) that prevent rain from being absorbed into the ground. As the runoff flows over these surfaces it picks up pollutants—household chemicals, oil, grease, fertilizers, herbicides, pet waste, and more—that have collected on them. Stormwater entering streams and channels carries these pollutants with it. In Eugene, the Willamette River, Amazon Creek, Delta Ponds, and other wetlands are showing the effects of pollution, some of which comes from stormwater runoff.

Water is a renewable resource only as long as it remains unpolluted. Each one of us has a responsibility to become knowledgeable about stormwater, to change behaviors that contribute to stormwater pollution, and to get involved in local and regional efforts to protect the rivers and streams that contribute to the livability of our community.

Wetland Connections: Relationships

Relationships between the land and living organisms are complicated and often intriguing. Within an ecosystem, living organisms are benefited by non-living elements and each other in ways that are not always obvious.

In the **west Eugene wetlands**, restoration work has helped bring back a balance between the land and living organisms. Restoring the wetlands has fixed broken links in the ecosystem and renewed relationships between species.

The plants, birds, and insects highlighted on this page are just a few of the hundreds of species that live in the wetlands. Each of these species thrives in the special environment provided by wetlands and they all have beneficial relationships within the ecosystem. Some of the relationships may surprise you!

Visit www.ci.eugene.or.us/parks/wetlands for more information about the restoration efforts in the west Eugene wetlands.

One plant, many influences. *Rumex salicifolius*, **willow-leaved dock**, is an example of a plant whose existence in the wetlands is important to the survival to many other species.

willow-leaved dock



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Rumex salicifolius

green-winged teal



Anas crecca

great copper butterfly



© Neil Björklund

Lycaena xanthoides

peregrine falcon



Falco peregrinus

It may look like to a weed to the untrained eye, but willow-leaved dock is a plant that plays a crucial role in the life of many other species. Recently, researchers made a startling discovery in the west Eugene wetlands. After 30 years with no confirmed sightings in the Willamette Valley, the great copper butterfly has been rediscovered in the wetlands and the willow-leaved dock is thought to be a major host plant for the butterfly. For more information about the great copper and other butterflies in Lane County, visit the Eugene/Springfield Chapter of the North American Butterfly Association at www.naba.org/chapters/nabaes.

The seeds of the willow-leaved dock are a popular food for green-winged teal, one of the most numerous waterfowl in the Willamette Valley. The teal are a favorite prey of the peregrine falcon, now making a comeback from near extinction in the western United States. While the peregrine falcon does not have a direct relationship with the dock plant, the indirect benefit this plant provides by supporting the green-winged teal is valuable and significant.

A curious relationship...

Willamette Valley gumweed (left) and **California broomrape** (right) have a very unique relationship. Willamette Valley gumweed is the host plant for California broomrape, a root parasite that cannot survive without nutrients and water derived from the roots of its host plant. Root parasites often have beautiful flowers, and broomrape is no exception. Broomrape's pale-colored fleshy flowers push up out of the ground without the typical stem and leaf structure common in most plants.

Considered rare in Oregon, the California broomrape is uncommon in west Eugene, but will eventually benefit from wetland restoration as populations of Willamette Valley gumweed increase and spread.

Willamette Valley gumweed



Photo: Sandra Miles

Grindelia integrifolia

In the west Eugene wetlands, gumweed is the favored nectar plant of the great copper butterfly (see above).

California broomrape



Orobanchaceae spp. californica



More Stormwater Connections

Regulations tighten for impaired waterways

The Willamette River and many of its tributaries continue to contain problem pollutants. New regulations, called Proposed Total Maximum Daily Loads (TMDLs) have been developed by the Oregon Department of Environmental Quality (DEQ) for particular pollutants in the Willamette River basin, including the Willamette River itself, and several of its tributaries. A TMDL is the amount of a pollutant a water body can accommodate without causing harm to its users such as people, fish and wildlife. A TMDL is calculated to protect the user that is most sensitive to a specific pollutant. The DEQ has determined that the Willamette River and its tributaries in the Eugene area support some or all of the following: salmonid fish spawning and rearing, anadromous fish passage, resident fish and aquatic life, fishing, and water contact recreation. TMDLs have been proposed for temperature, mercury, bacteria, dissolved oxygen, and turbidity.

Throughout the development of the proposed TMDLs, staff from Eugene, Springfield and other member agencies in the Association of Clean Water Agencies have reviewed how the new regulations might affect local stormwater and wastewater operations, and provided comments to DEQ.

The revised TMDLs are scheduled to be submitted by the DEQ to the Environmental Protection Agency for approval by summer 2005. The TMDLs will most likely result in significant changes to Eugene's National Pollution Discharge Elimination System (NPDES) permit and related Stormwater Management Plan, and may result in changes to the regional wastewater treatment plant facilities and operations.

For more information about the NPDES permit or TMDLs, contact Therese Walch, Water Resources Manager at 682-8647.

The TMDL process takes a broader look at a water body and the watershed it is in and focuses on all sources of pollutants. Those include from point (direct) sources such as wastewater treatment plants and industries, as well as nonpoint (indirect) sources such as agriculture and forestry practices.



Lane County and City of Eugene team up on stormwater issues

When stormwater quality became a nationwide issue in the 1980's, Congress reauthorized the Clean Water Act, which required that communities begin reducing the discharge of stormwater pollutants in local waterways. At first, larger communities, like Eugene, were required to develop a

stormwater management plan (SWMP) and then apply for a National Pollution Discharge Elimination System (NPDES) permit. Eventually, smaller communities would be required to develop SWMP plans with modified requirements.

Lane County has applied for an NPDES permit under Phase 2 of the NPDES program. The County's Stormwater Management Plan (SWMP) addresses six activities covered by the program: public education and outreach, public involvement and participation in developing and implementing a SWMP, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention and good housekeeping for municipal (County) operations.

In the interest of efficiency, the Board of County Commissioners authorized an intergovernmental agree-

ment with Eugene so that Lane County could adopt the portions of Eugene's SWMP that pertain to the county's requirements and implement them into the County SWMP. Eugene has agreed to administer certain regulations for the County.

This means that both Eugene and Lane County will enforce regulations as they apply to citizens who live within the area between the Eugene city limits and the Eugene Urban Growth Boundary. For example, Eugene will be responsible for erosion prevention and construction site management activities while Lane County will provide enforcement for improper discharges. Both agencies will partner in education and planning efforts to help improve the overall stormwater quality within the metro area.

For more information on Lane County's stormwater quality efforts, contact Mike Russell at 682-6968.



Meet Lily's cousin Lyle!

There's a new frog in town! Lily's cousin, Lyle, has come to visit Lily's pad. Even though they don't look alike, both of them are Pacific green tree frogs. Lily is a frequent visitor to elementary grade classes in Eugene when teachers are providing instruction about stormwater pollution. Lyle has offered to help with classroom visits too. For more information about scheduling our enviro-friendly frogs for a visit, contact Kathy Eva, Stormwater Education Specialist, at 682-2739.

More Stormwater Connections

Compost Tea : Unusual brew improves plant health

Does the name compost tea conjure up images of a tea strainer with a lump of compost? Relax. There's quite a science that goes along with the name. One of the most important facts about compost tea is that it contains a complex set of organisms such as bacteria, fungi, protozoa and nematodes that are extracted from compost brewed in water. Soluble nutrients removed from the compost can benefit plant growth.

It is important to use a good quality compost to get a good quality tea. Compost tea helps protect plant surfaces, retain soil nutrients (no leaching or erosion), makes more nutrients available to the plant, improves soil conditions, and makes the soil more suitable for plant growth.

Isn't using compost enough? Although compost provides good nutrients to the soil, there is a difference between compost and compost tea. Compost is a mix of organic materials which microorganisms have begun a significant process of breaking down. And any gardener that's used compost will tell you how great it is for your soil. Compost tea essentially makes the benefits of compost go farther because it usually contains a higher concentration of microbes. Aerobically brewing an extract of compost, with or without added nutrients, encourages the growth of specific beneficial organisms. Once the brewing process is complete, tea is ready to use on plants and soil.

Tea can be applied to leaves and soil by using a pump spray device or sprinkler. Plant surfaces should be applied as evenly and thoroughly as possible and soil should be completely drenched. Since toxic chemicals, dust and air pollution kill the organisms on leaf surfaces, repeated applications of compost tea means healthier soil, healthier plants and less disease. Compost tea should be applied at regular intervals. Benefits can be seen with as little as 2 to 3 applications annually. For general maintenance purposes, 6 to 8 applications per year should work unless plants are stressed or your soil needs a boost.

Compost tea may contribute to the health of your plants but may not solve all problems in your yard. The soil and environment of your yard can be further enhanced by using organic fertilizers, soil amendments, mulch, aeration, and other practices specific to the needs of your landscape.

If you don't brew your own compost tea or are looking for local sources, refer to the chart below that lists places where compost tea can be purchased. Availability is expected to begin in March or April (weather permitting). Most providers recommend you bring your own container – like an empty milk jug. Be sure to call ahead to confirm availability for this season.



Nurseryman Kenan Rowlett gives these container plants a dose of compost tea from a pump spray device. Well-brewed tea is rich in microorganisms that are highly beneficial to your plants' health and growth.

Earth Day Celebration moves to riverfront location

Join us for a festive and educational celebration on April 23rd from 11 am - 5 pm at EWEB's River Edge Plaza. Through displays, demonstrations, hands-on activities, music and more, Earth Day 2005 will reflect the ever-continuing relationship of individuals and our community to the earth and its resources. Educational booths and displays from non-profit, environmental and community organizations will be on hand to share information, activities, and demonstrations related to local, regional and global issues.

Be sure to check out the great selection of music at our outdoor stage offered throughout the day.

Love a parade? Be sure to join or watch the locally known Procession of All Species parade, starting at 2 pm. Kids of all ages are encouraged to join us with or without costume or adornments for this musical procession. Look for a program guide in April 21st issue of Eugene Weekly.



A few local sources for compost tea; check your favorite nursery for availability

Providers:	Location:	Phone:	Availability
Artistic Gardener Bamboo Nursery	west Eugene	345-4388	Sat.
Down to Earth	downtown Eugene	342-6820	Sat
Gray's Garden Center	downtown Eugene, east Springfield	345-1569	Daily
Johnson Brothers Greenhouse	west of Coburg	484-1649	Thurs. & Sat.
Lane Forest Products	northwest Eugene, east Springfield	345-9085	Thurs-Sat.
Rexius	west Eugene, east Springfield	342-1835	Daily



Hi! I'm Lily, the Pacific treefrog. I hope you enjoyed meeting Lyle, my "urban" cousin (page 6).

Did you know we are all part of a food web? A food web can be most simply defined as who eats what. In my food web, I eat lots of bugs and worms and big fish and blue herons like to eat me! (Gulp!)

A Natural Connection: The Food Web

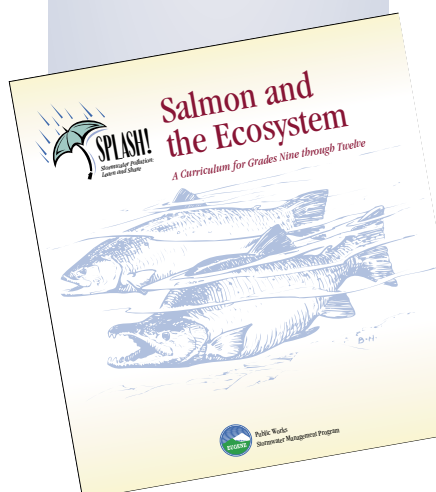
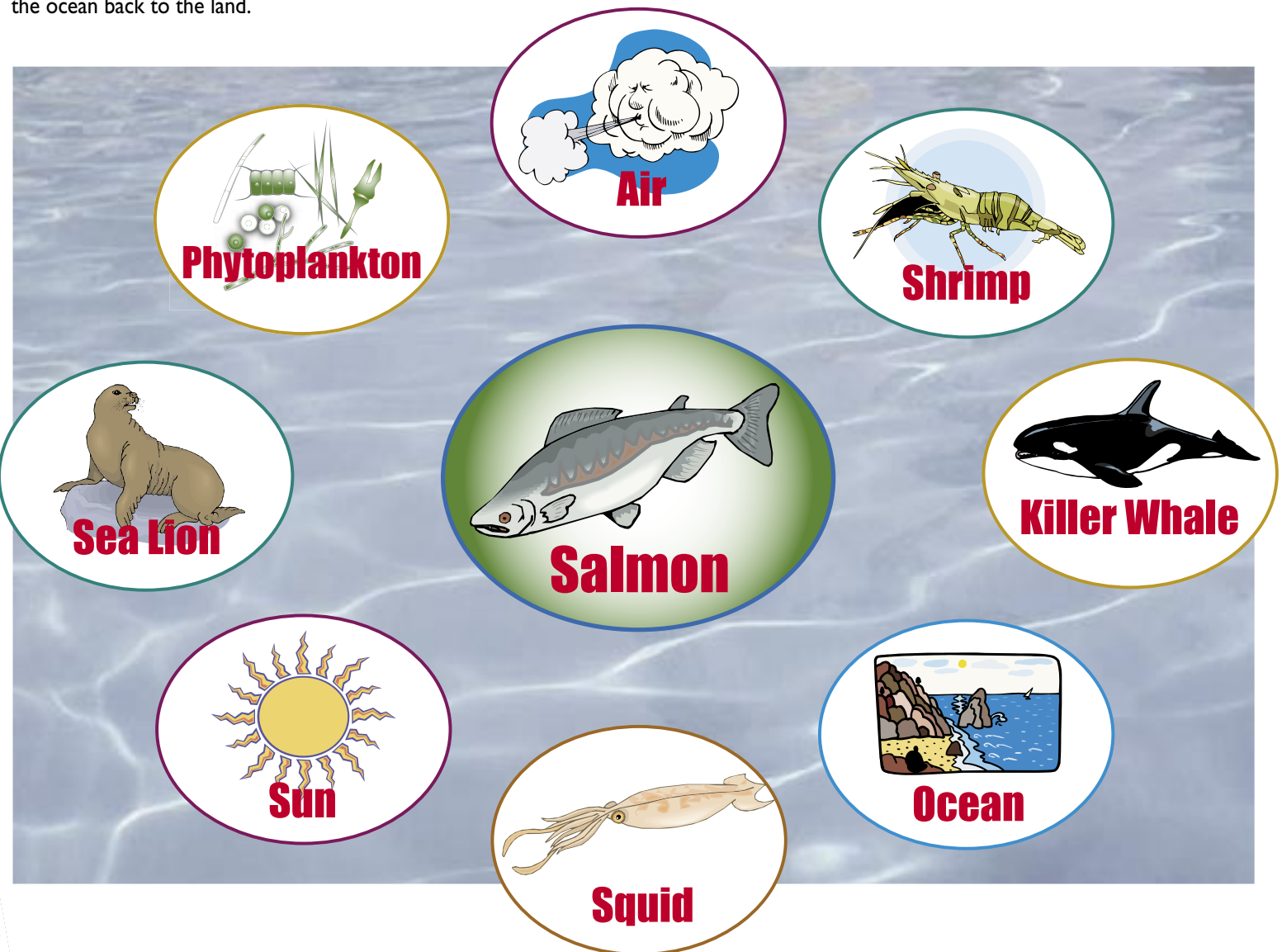
Life begins with the sun. The energy from the sun is transformed by green plants (via photosynthesis) into stored energy. This energy is passed through the food web as plant-eating animals become food for other animals. Non-living elements like the sun, along with air and water, are essential for life.

Phytoplankton, tiny green plants that live in the ocean, convert the sun's energy and are the foundation of the ocean food web. Phytoplankton are consumed by shrimp, squid, and small ocean fish which provide food for salmon. The energy is passed on to killer whales and sea lions when they eat salmon. When salmon return to their home streams to spawn, they bring the energy derived from the ocean back to the land.

Create an Ocean Food Web!

The pictures below represent elements and creatures that live in the ocean. Follow the instructions to create an ocean "food web."

1. What elements and organisms do salmon need to survive? Draw lines to connect the picture of the salmon and your choices.
2. What animals eat salmon? Draw lines to connect them to salmon.
3. What do phytoplankton, squid, and shrimp need to survive? Draw lines to connect each of them to the elements and creatures they need to survive.



Teachers: New Salmon Curriculum Available!

Salmon and the Ecosystem explores factors that have contributed to the decline of salmon in the Northwest and the impact of losing a species that is key to the health of an entire ecosystem. The unit also focuses on how stormwater pollution affects salmon and their habitat.

Salmon and the Ecosystem includes games and exercises that will help students learn about food chains and food webs,

salmon homing instincts and human activities that can hurt salmon and their habitat. Handouts full of salmon facts and history, along with diagrams illustrating how salmon fit into the food web, are also provided.

This unit, along with related materials, is available for students in grades five-eight and nine-12. To obtain your copy of the curriculum, call 682-2739.